

**We claim:**

1. A method of automatically establishing a desired communication between an originating device and a target device, said originating device and said target device each  
5 having an associated profile, said method comprising steps of:

(i) determining a profile compatibility between said originating device and said target device;

(ii) establishing said desired communication, if a direct profile compatibility between said originating device and said target device is found, said establishing being  
10 directly between said originating device and said target device; and

(iii) establishing said desired communication, if said direct profile compatibility between said originating device and said target device is not found, said establishing being indirectly between said originating device and said target device by incorporating at least one additional device, said at least one additional device having an  
15 associated profile, said incorporation forming linked device pairs among said originating device, said target device and said at least one additional device, whereby said incorporation establishes a direct profile compatibility between each said linked pair of said devices.

20 2. A method according to claim 1, whereby said incorporating comprises steps of:

(a) communicating, by one of said originating device and said target device, to a first additional device, thereby forming linked device pairs among said originating device, said target device and said at least one additional device;

(b) establishing said desired communication, if direct profile compatibility  
25 is established between each said linked pair of devices;

(c) communicating, by one of said originating device, said target device and said first additional device, if said direct profile compatibility is not established between each said linked pair of devices, to a second additional device, thereby forming linked device pairs among said originating device, said target device, said first and said  
5 second additional devices; and

(d) repeating steps (b) and (c) until said desired communication is established, said direct profile compatibility being established between each linked pair of devices.

10 3. A method according to claim 1, whereby said incorporation comprises one of:

(x) forming a chain of devices commencing with said originating device, proceeding to each said at least one additional device in succession, and concluding with said target device; and

(y) forming a chain of devices commencing with said target device,  
15 proceeding to each said at least one additional device in succession, and concluding with said originating device.

4. A method according to claim 1 wherein each said device comprises one of a device or a service.

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5. A method of establishing a desired communication between an originating entity and a target entity, each said entity being coupled to a communication network and having a corresponding profile related to information handled by said entity, said method comprising steps of:

25 (i) determining a compatibility between the profile of said originating entity and the profile of said target entity;

(ii) if step (i) determines a direct profile compatibility between said originating entity and said target entity, establishing said desired communication directly between said originating entity and said target entity; and

(iii) if step (i) fails to determine said direct profile compatibility between said  
5 originating entity and said target entity, establishing said desired communication indirectly between said originating entity and said target entity by interposing at least one additional entity between said originating entity and said target entity to form a chain of said entities, each said additional entity having an associated profile, said interposing forming linked entity pairs between adjacent entities in said chain, whereby said  
10 interposing establishes a direct profile compatibility between each said linked pair of said entities.

6. A method according to claim 5, whereby said incorporation comprises one of:

(x) forming a chain of said entities commencing with said originating  
15 entity, proceeding to each said at least one additional entity in succession, and concluding with said target entity; and

(y) forming a chain of devices commencing with said target entity, proceeding to each said at least one additional device in succession, and concluding with said originating device.

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7. A method of establishing a desired communication between an originating entity and a target entity, each said entity being coupled to a communication network and having a corresponding profile related to information handled by said entity, said method comprising steps of:

(i) determining a compatibility between the profile of said originating entity and the profile of said target entity;

(ii) if step (i) determines a direct profile compatibility between said originating entity and said target entity, establishing said desired communication directly  
5 between said originating entity and said target entity; and

(iii) if step (i) fails to determine said direct profile compatibility between said originating entity and said target entity:

(a) specifying one of said originating entity and said target entity as a searching entity;

10 (b) searching said network from said searching entity to identify an additional entity coupled to said network and having a direct profile compatibility with said searching entity to thereby form a linked entity pair providing communications between said searching entity and said additional entity;

(c) specifying said additional entity as said searching entity;

15 (d) repeating steps (b) and (c) until the non-specified one of said originating entity and said target entity from step (a) is identified as said additional entity; and

(e) establishing said desired communication between said originating entity and said target entity via said linked entity pairs of devices.

20 8. A method according to claim 7 wherein each said entity is selected from the group consisting of a device and a service.

9. A method of automatically establishing a process between an originating device and a target device, each said device having an associated profile, said method comprising  
25 steps of:

(i) determining a profile compatibility between said originating device and said target device;

(ii) establishing said process, if a direct profile compatibility between said originating and said target device is found, said establishing being directly between said  
5 originating device and said target device, whereby said originating device communicates a message, using a messaging protocol, to said target device, said process being dependent upon said message; and

(iii) establishing said process, if said direct profile compatibility between said originating and said target device is not found, said establishing being indirect  
10 between said originating device and said target device, by incorporating at least one additional device, said at least one additional device having an associated profile, said incorporation forming linked device pairs among said originating device, said target device and said at least one additional device, said incorporation establishing both a direct profile compatibility between each linked pair of said devices, and a compatible mapping  
15 of said message from said originating device to said target device.

10. A method according to claim 9, whereby said incorporating comprises sub-steps of:

(a) communicating, by one of said originating device and said target device, of said message and a first address, to a first additional device, thereby forming  
20 linked device pairs among said originating device, said target device and said first additional device, said communicating not requiring understanding by said communicating device of said message;

(b) establishing said process, dependent upon said message and said address, if direct profile compatibility is established between each linked pair of devices,

whereby said compatible mapping of said message is established from said originating device to said target device;

(c) communicating, by one of said originating device, said target device and said first additional device, if said direct profile compatibility is not established between each linked pair of devices, of said message, said first address and a second address, to a second additional device, thereby forming linked device pairs among said originating device, said target device, said first and said second additional devices, said communicating not requiring understanding by said communicating device of said message; and

(d) repeating steps (b) and (c) until said process is established, said direct profile compatibility being established between each linked pair of devices, and said compatible mapping of said message being established from said originating device to said target device.

11. A method according to claim 9, whereby said message comprises at least one of a command and a data value.

12. A method according to claim 9, whereby said messaging protocol is the Extended Markup Language (XML).

13. A method of establishing a process between an originating entity and a target entity, each said entity being coupled to a communication network and having a corresponding profile related to information handled by said entity, said method comprising steps of:

(i) determining a compatibility between the profile of said originating entity and said target entity;

(ii) if step (i) determines a direct profile compatibility between said originating entity and said target entity, establishing said process directly between said originating entity and said target entity, whereby said originating entity communicates a message, using a messaging protocol, to said target entity, said process being dependent  
5 upon said message; and

(iii) if step (i) fails to determine said direct profile compatibility between said originating entity and said target entity:

(a) specifying one of said originating entity and said target entity as a searching entity;

10 (b) searching said network from said searching entity to identify an additional entity coupled to said network and having a direct profile compatibility with said searching entity to thereby form a linked entity pair providing communications using said messaging protocol between said searching entity and said additional entity;

15 (c) specifying said additional entity as said searching entity;

(d) repeating steps (b) and (c) until the non-specified one of said originating entity and said target entity from step (a) is identified as said additional entity; and

(e) establishing said desired communication between said originating entity and said target entity via said linked entity pairs of devices to thereby establish said  
20 process and a compatible mapping of said message from said originating device to said target device.

14. A method according to claim 13 wherein said entities each comprise one of a device or a service.

15. A method according to claim 13, whereby said message comprises at least one of a command and a data value.

16. A method according to claim 13, whereby said messaging protocol is Extended Markup Language (XML).

17. A transparent telecommunications system comprising:

a communication network;

a plurality of devices coupled to said network, each said device having associated therewith at least one service, each said service having a corresponding profile related to information handled by said service, each said service comprising:

means for determining a compatibility between the profile of said service and a further said service with which functional communications are intended;

means for establishing said functional communications between said service and said further service where a direct profile compatibility was found by said means for determining; and

means for searching said network to identify an intermediate service having a profile compatibility with said service and by which intermediate functional communications between said service and said intermediate service can be established.

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18. An apparatus for communicating with a first device and a second device, comprising:

receiver for receiving, from the first device, a first request including a first command to process image data;

generator for generating a second request including the first command and a second command to process the image data the subject of the first command; and

sender for sending the second request generated by said generator to said second device.

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19. The apparatus of claim 18 wherein the image data is processed by the first command.

20. An apparatus according to claim 18, wherein the first command is a command to get image data from a designated device.

21. An apparatus according to claim 20, wherein the second device gets image data from the device designated by the first command.

22. An apparatus according to claim 18, wherein the second command is a command to get image data in a designated image format.

23. An apparatus according to claim 22, wherein the second device translates image data to the image format designated by the second command.

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24. An apparatus according to claim 18, wherein the first device is a host computer, the second device is an input device, and the apparatus is a printer.

25. An apparatus according to claim 18, wherein the first and second requests are each described in XML code, and said generator generates the second request so that a tag

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statement corresponding to the second command encloses a tag statement corresponding to the first command.

26. An apparatus according to claim 20, wherein the first device is a host computer,  
5 the second device is an input device, and the apparatus is a printer and wherein said host computer forms part of a communications network interconnecting said input device and said printer.

27. An apparatus according to claim 26, wherein said designated device is an image  
10 recording device and said input device converts image data, obtained in response to said first command from said image recording device, according to said second command to a format for reproduction by said printer.

28. A device for coupling to a communications network, said device comprising:  
15 a performance engine configured for performing a service and representing at least one of a source and target of information communicable via said network;  
a device profile characterising said information for performance of said service;  
a discovery/announcement element configured for communicating said device profile via said network to identify at least one further device or service accessible via  
20 said network and representing at least a complementary one of a target and source respectively of said information; and  
a command generator configured for communicating said information between said performance engine, and at least one device or service identified by said discovery/announcement element.

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29. A device according to claim 28, wherein said command generator further comprises a command encapsulator for encapsulating a first command statement related to said information and intended for implementation by a first said further device or service within a second command statement intended for implementation by a second said further device or service.

30. A device according to claim 28, wherein said device is an image recording device and said performance engine comprises an image capture arrangement that represents a source of image information for provision to said further device or service.

31. A device according to claim 28, wherein said device is an image reproduction device in which said performance engine comprises a display arrangement that represents a target of image information supplied from said further device or service.

32. A device according to claim 31, wherein said image reproduction device comprises an electronic display.

33. A device according to claim 31, wherein said image reproduction device comprises a printer.

34. A device according to claim 28, wherein said device comprises a computer arrangement and said performance engine comprises a software application operable by said computer arrangement to manipulate image information, said image information being received from a first said further device or service and being supplied, once manipulated by said software application, to a second said further device or service.

35. A program which, when running on a computer device, enables said device to function as apparatus including:

- a performance engine configured for performing a service and representing at least one of a source and target of information communicable via said network;
- a device profile characterising said information for performance of said service;
- a discovery/announcement element configured for communicating said device profile via said network to identify at least one further device or service accessible via said network and representing at least a complementary one of a target and source respectively of said information; and
- a command generator configured for communicating said information between said performance engine, and at least one device or service identified by said discovery/announcement element.

36. A program according to claim 35, wherein said command generator further comprises a command encapsulator for encapsulating a first command statement related to said information and intended for implementation by a first said further device or service within a second command statement intended for implementation by a second said further device or service.

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37. A computer readable medium comprising a computer program for establishing a desired communication between an originating entity and a target entity, each said entity being coupled to a communication network and having a corresponding profile related to information handled by said entity, said computer program comprising modules for performing a method comprising the steps of:

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(i) determining a compatibility between the profile of said originating entity and the profile of said target entity;

(ii) if step (i) determines a direct profile compatibility between said originating entity and said target entity, establishing said desired communication directly  
5 between said originating entity and said target entity; and

(iii) if step (i) fails to determine said direct profile compatibility between said originating entity and said target entity:

(a) specifying one of said originating entity and said target entity as a searching entity;

10 (b) searching said network from said searching entity to identify an additional entity coupled to said network and having a direct profile compatibility with said searching entity to thereby form a linked entity pair providing communications between said searching entity and said additional entity;

(c) specifying said additional entity as said searching entity;

15 (d) repeating steps (b) and (c) until the non-specified one of said originating entity and said target entity from step (a) is identified as said additional entity; and

(e) establishing said desired communication between said originating entity and said target entity via said linked entity pairs of devices.